

REMARKS

The Office Action mailed on May 6, 2002, has been received and reviewed.

Claims 47, 48, 50-56, 58-68, and 75-90 are currently pending in the above-referenced application. Claims 47, 48, 50-56, 58-68, 75-79, and 81-85 stand rejected. Specifically, claims 63, 78, 79, and 81 have been objected to based on an insufficient antecedent basis for the limitation in the claims.

Claims 80 and 86-90 have been withdrawn from consideration as being drawn to a non-elected species of the invention but, upon the allowance of a generic claim, must be considered by the Office.

New claims 91-105 have been added. It is respectfully submitted that the subject matter recited in new claims 91-105 is fully supported by the original disclosure of the above-referenced application.

Reconsideration of the above-referenced application is respectfully requested.

4. Election/Restriction

Claims 80 and 86-90 are withdrawn from further consideration as agreed upon in a telephone interview between the Examiner, Mr. Ori Nadav, and the Applicant's attorney, Brick G. Power, Registration No. 38,581.

5. Objections to Claims 63, 78, 79, and 81

Claims 63, 78, 79, and 81 have been objected to based on an insufficient antecedent basis for the limitation in the claims. Appropriate corrections have been made.

6. 35 U.S.C. § 102 Anticipation Rejections

A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference. *Verdegaal Brothers v. Union Oil Co. of California*, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). The identical invention

must be shown in as complete detail as is contained in the claim. *Richardson v. Suzuki Motor Co.*, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989).

7. Anticipation Rejection Based on U.S. Patent No. 5,969,424 to Matsuki et al.

Claims 64-66, 68, 75, 77-79, and 81-83 stand rejected under 35 U.S.C. § 102(e) as being anticipated by Matsuki et al. (U.S. Patent No. 5,969,424). Applicant respectfully traverses this rejection, as hereinafter set forth.

Regarding independent claim 64 and independent claim 75, the Matsuki et al. reference, as pointed out in the Office Action, describes a conductive element 7 as being comprised of a first metallic layer 13, a second metallic layer 15, and a third metallic layer 16 (column 7, lines 31-33). However, the Matsuki et al. reference also points out that the metallic layers are comprised of different metals with dissimilar mechanical and electrical properties to achieve varied results. Matsuki et al. teaches that the third metallic layer 16 should have a high hardness property to resist deformation (column 9, lines 23-26). Similarly, Matsuki et al. teaches the desirability of a high conductivity property for the second metallic layer 15, and the possibility of the first metallic layer 13 being multi-layered with the top layer as copper to enhance adhesion to the second metallic layer 15 when the second metallic layer is copper (column 8 lines 29-35). Consequently, Matsuki et al. inherently and expressly teaches that the layers have dissimilar properties.

The present invention, as recited in independent claims 64 and 75, does not rely on dissimilar properties for the plurality of superimposed, contiguous, mutually adhered layers. In contrast, claims 64 and 75, as amended and presented herein, indicate that the plurality of superimposed, contiguous, mutually adhered layers are comprised of the same conductive material. It is, therefore, respectfully submitted that each and every element as set forth in amended independent claims 64 and 75 is not found, either expressly or inherently, in the

Matsuki et al. reference, as required for a 35 U.S.C. § 102 anticipation rejection. Therefore, amended independent claims 64 and 75 are now allowable.

Because claims 65, 66 and 68 depend from allowable claim 64, they should be allowed. Similarly, claims 77-79 and 81-83 should be allowed as depending from claim 75, which is allowable.

Further regarding claim 83, Applicant respectfully disagrees that figure 2 of Matsuki et al. teaches that the support structure 12 comprises a plurality of superimposed, contiguous, mutually adhered layers of material. The layers referred to in the Office Action (13, 15, 16) are part of the conductive layer on the semiconductor die, not the support structure. There is no express or inherent description in Matsuki et al. of the support structure's composition as being layered in any fashion. As such, the Matsuki et al. reference does not describe each and every element, either expressly or inherently, as set forth in claim 83, as required for a 35 U.S.C. § 102 anticipation rejection.

Therefore, it is respectfully requested that the 35 U.S.C. § 102 rejections of claims 64-66, 68, 75, 77-79, and 81-83 be withdrawn.

8. 35 U.S.C. § 103(a) Obviousness Rejections

M.P.E.P. 706.02(j) sets forth the standard for a Section 103(a) rejection:

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on Applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

9. Obviousness Rejection Based on U.S. Patent No. 5,969,424 to Matsuki et al. in view of U.S. Patent No. 4,954,873 to Lee et al.

Claims 47-48, 50-56, 58-63, 67, and 76 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Matsuki et al. (U.S. Patent No. 5,969,424) in view of Lee et al. (U.S. Patent No. 4,954,873). Applicant respectfully traverses this rejection, as hereinafter set forth.

With respect to claims 47, 48, 52, 56, Applicant respectfully disagrees with the assertion in the Office Action that a “conductive trace” and “conductive material” are synonymous. A conductive trace implies a path in which the energy is confined and conducted. Additionally, the path may be multi-directional. Whereas, a conductive material simply means that the material conducts energy with no implication as to how or where the energy is channeled.

This is a significant distinction because the Lee et al. reference specifically discloses only an anisotropic elastomeric conductor. Being anisotropic, the elastomeric conductor is suitable for conduction in only one direction, namely in a direction perpendicular to the plane on which the contact pads lie. Specifically, the Lee et al. reference teaches, “[i]n general, the pattern in which the connector pads 34 are arranged on the semiconductor device 30 will correspond to that in which the contact pads 36 are arranged on the substrate” (column 6, lines 34-38). While the Lee et al. reference uses “in general” in this statement, everything in the disclosure indicates that the pad locations must be co-located to form an electrical connection using the anisotropic elastomeric conductor. As a result, the Lee reference teaches away from use as a conductive trace, which may conduct electricity in any direction defined by the path of the trace. It is improper to combine references where the references teach away from their combination. *In re Graselli*, 713 F.2d 731, 743, 218 USPQ 769, 779 (Fed Cir. 1983). Therefore, the combination of Matsuki et al. and Lee et al. should be considered improper and cannot establish a *prima facie* case of obviousness under 35 U.S.C. § 103.

Additionally, while the Lee et al. reference may motivate the combination because it is suitable for electronic devices having arrays of electrical contact pads, there would be no

reasonable expectation of success to combine the anisotropic conductor material of Lee et al. with a conductive trace such as that taught in Matsuki et al. because trace paths may extend in more than one direction, while the anisotropic electrical paths in the elastomeric material of Lee et al. may not. With no reasonable expectation of success, the combination of Matsuki et al. and Lee et al. cannot support a *prima facie* case of obviousness under 35 U.S.C. § 103.

Accordingly, under 35 U.S.C. § 103(a), independent claims 47 and 52 are allowable over Matsuki et al. and Lee et al.

In addition, because claims 48, 50, and 51 depend from allowable claim 47, claims 48, 50, and 51 are allowable. Likewise, because claims 53-56 and 58-60 depend from claim 52, which is allowable, each of these claims is also allowable.

With respect to claims 67 and 76, these claims are allowable as depending from allowable claims 67 and 76, respectively. Moreover, claims 67 and 76 do not recite a "conductive trace element", instead they simply recite "conductive elements". Also, the element of a plurality of superimposed, contiguous, mutually adhered layers comprising the same conductive material is not taught in either Matsuki et al. or in Lee et al. Therefore, Matsuki et al. and Lee et al., individually or combined, fail to teach or suggest all the claim limitations in claims 67 and 76, as required to establish a *prima facie* case of obviousness under 35 U.S.C. § 103(a). As a result, claims 67 and 76 are allowable.

10. Obviousness Rejection Based on U.S. Patent No. 5,007,576 to Congleton et al. in view of U.S. Patent No. 5,969,424 to Matsuki et al.

Claims 75, 84, 85 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Congleton et al. (U.S. Patent No. 5,007,576) in view of Matsuki et al. (U.S. Patent No. 5,969,424). Applicant respectfully traverses this rejection, as hereinafter set forth.

Regarding claim 75, as stated in the Office Action the Congleton et al. reference does not teach at least one conductive element comprising a plurality of superimposed, contiguous, mutually adhered layers comprising the same conductive material. Nor does Matsuki et al. teach this element. Therefore, Congleton et al. and Matsuki et al., individually or combined, fail to teach or suggest all the claim limitations in claim 75, as required to establish a *prima facie* case of obviousness under 35 U.S.C. § 103(a). As a result, under 35 U.S.C. § 103(a), claim 75 is allowable over the combination of Congleton et al. and Matsuki et al.

Claims 84 and 85 are both allowable, among other reasons, as depending from claim 75, which is allowable.

In view of the foregoing, it is respectfully requested that the 35 U.S.C. § 103(a) rejections of claims 47-48, 50-56, 58-63, 67, 75, 76, 84, and 85 be withdrawn.

NEW CLAIMS

New claims 91-105 have been added to the above-referenced application. It is respectfully submitted that none of new claims 91-105 introduces new matter into the above-referenced application. Entry of these claims is respectfully requested.

New claim 91 includes each of the limitations of independent claim 47, and also recites that the conductive polymer of the plurality of layers is "the same". Claims 92-94 depend from claim 91.

New claim 95 is an independent claim which recites each of the limitations of independent claim 52, as well as that the plurality of layers are formed from "the same" conductive polymer. New claims 96-105 depend from claim 94.

It is respectfully submitted that each of claims 91-105 is allowable.

CONCLUSION

Claims 47-48, 50-56, 58-68, 75-90, and 91-105 are believed to be in condition for allowance. An early notice of the allowability of these claims is respectfully solicited, as is an indication that that above-referenced application has been passed for issuance. If any issues preventing allowance of the above-referenced application remain which might be resolved by way of a telephone conference, the Office is kindly invited to contact the undersigned attorney.

Respectfully Submitted,



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BGP/hlg:djp

Enclosure: Version With Markings to Show Changes Made

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VERSION WITH MARKINGS TO SHOW CHANGES MADE
IN THE CLAIMS:

Please amend the claims as follows:

63. (Amended) The semiconductor device of claim 62, wherein said at least one conductive trace [element] contacts one of said leads.

64. (Twice amended) A semiconductor device assembly, comprising:
a carrier; and
at least one semiconductor die adjacent said carrier, said semiconductor die including bond pads;
and
conductive elements electrically connecting contacts of said carrier to corresponding bond pads,
each of said conductive elements including a plurality of superimposed, contiguous,
mutually adhered layers, each of said layers comprising the same conductive material.

75. (Amended) A semiconductor device assembly, comprising:
a first semiconductor device component including at least one contact pad;
a second semiconductor device component including at least one contact pad; and
at least one conductive element connecting said at least one contact pad of said first
semiconductor device component to said at least one contact pad of said second
semiconductor device component, said at least one conductive element comprising a
plurality of superimposed, contiguous, mutually adhered layers comprising the same
conductive material.

78. (Amended) The semiconductor device assembly of claim 75, wherein at least one
of said first semiconductor device component and said second semiconductor device
component[s] comprises a semiconductor die.

79. (Amended) The semiconductor device assembly of claim 75 [78], wherein [said] at least one of said first semiconductor device component and said second semiconductor device component[s] comprises a packaged semiconductor die.

81. (Amended) The semiconductor device assembly of claim 75, wherein at least one of said first semiconductor device component and said second semiconductor device component[s] comprises a carrier substrate.